IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) An adaptive line enhancer comprising an adaptive Gray-Markel lattice notch filter having an adaptive notch frequency, said adaptive Gray-Market lattice notch filter having a transfer function:

$$H_{lattice} = \frac{N(z)}{D(z)} = (\frac{1+\alpha}{2}) \frac{1+2k_0 z^{-1} + z^{-2}}{1+k_0(1+\alpha)z^{-1} + \alpha z^{-2}}$$

in which the notch frequency is determined according to a notch frequency variable k,

characterized in that said adaptive line enhancer further comprises means for determining a value of k for the $n+1^{th}$ sample period ~~is determined~~ according to the following equation:

$$k(n+1) = k(n) - \text{sgn}[y(n)]\text{sgn}[UPDATEFN] \times \mu$$

in which y(n) is a notch filter output, μ is an adaptation constant, and UPDATEFN has a transfer function in the z-transform domain of:

$$\frac{(\alpha-1)(k(n)-1)z^{-1}}{1+k(n)(1+\alpha)z^{-1}+\alpha z^{-2}}$$

~~in which~~where α determines a bandwidth and k(n) is a variable for determining a current notch frequency.

2. (Currently Amended) ~~An~~ The adaptive line enhancer ~~according to~~as claimed in claim 1, in which the Gray-Markel lattice notch filter is a wave digital lattice filter.

3. (Currently Amended) ~~An~~ The adaptive line enhancer ~~according to~~as claimed in claim 2, in which the wave digital lattice filter comprises:

a first dynamic adapter ~~(310)~~ having a first input ~~from~~ coupled to receive an input signal of the adaptive line enhancer, a second input and an adaptive coefficient input; ~~from~~

a bandwidth determining block ~~(335),~~coupled to said adaptive coefficient input of said first dynamic adapter;

a first summing block ~~(320)~~ for ~~receiving~~ summing the input signal and a first output from the first dynamic adapter ~~(310) and summing the same,~~;

an amplifier block ~~(325)~~ for amplifying ~~the~~ an output of first summing block ~~(320)~~and for supplying said amplified output to an output of the adaptive line enhancer; and~~,~~

a second dynamic adapter ~~(315) for receiving~~having a first input ~~from~~ coupled to a third output of the first dynamic adapter ~~(310)~~, a first output ~~providing~~ coupled to a second input ~~to~~ of the first dynamic adapter, a second output, a third output ~~providing an input to~~coupled, in feedback, to a second input of the second dynamic adapter ~~(315)~~, and an adaptive coefficient input.

4. (Currently Amended) ~~An~~ The adaptive line enhancer ~~according to~~as claimed in claim 3, in which the first and second dynamic adapters ~~(310, 315) comprise~~each comprises:

a first input~~,~~;

a second input~~,~~;

an adaptive coefficient input~~,~~;

a first subtracter ~~(240)~~ for subtracting the second input from the first input~~,~~;

a multiplier ~~(250)~~ for multiplying ~~the~~ an output of the first subtracter by the adaptive coefficient input~~,~~;

a second subtracter ~~(260)~~ for subtracting the second input from ~~the~~ an output of the multiplier~~,~~; and

a third subtracter ~~(270)~~ for subtracting the first input from the output of the multiplier, ~~in which~~ wherein a first output is provided by ~~the~~ an output of the second subtracter ~~(260)~~, a second output is provided by ~~the~~ an output of the third subtracter ~~(270)~~, and a third output is provided by the

output of third subtracter having been delayed by a delay block ~~(280)~~.

5. (Currently Amended) ~~An~~ The adaptive line enhancer ~~according to~~ as claimed in claim 3, in which the adaptive line enhancer further comprises:

a first signum function block for providing the adaptive coefficient input for the second dynamic adapter ~~(315) is provided by a~~, said first signum function block ~~(345)~~ being coupled to receive ~~for receiving~~ the second output from the second dynamic adapter ~~(315),~~ ;

a second signum block ~~(350)~~ for receiving the amplified output from the amplifier block ~~(325),~~ ;

a first multiplier ~~(355)~~ for multiplying ~~the~~ outputs of the first and second signum blocks ~~,~~ ;

an adaptation speed determining block ~~(365)~~ for generating an output to determine a speed at which the desired frequency is locked ~~on to,~~ onto;

a second multiplier ~~(360)~~ for multiplying ~~the~~ outputs of the first multiplier ~~(355)~~ and the adaptation speed determining block ~~(365),~~ ;

a second summing block ~~(370)~~ for summing ~~the~~ an output of the second multiplier ~~(360)~~ and ~~the~~ an output of a notch frequency determining block ~~(340),~~ ;

an amplitude limiting block ~~(375)~~ for clipping an output k(n+1) of the second summing block (370) within a range]-1 1[~~,~~ [; and

a delay block ~~(380)~~ for delaying an output of the amplitude limiting block ~~(375)~~, an output of the delay block ~~(380)~~ comprising the adaptive coefficient input and ~~the~~ an updated value of the notch frequency determining block.

6. (Currently Amended) A method for adaptive line enhancement, comprising the step of:

adaptive line enhancing an adaptive Gray-Markel lattice notch filter with an adaptive notch frequency, said adaptive Gray-Market lattice notch filter having a transfer function:

$$H_{lattice} = \frac{N(z)}{D(z)} = \left(\frac{1+\alpha}{2}\right)\frac{1+2k_0 z^{-1}+z^{-2}}{1+k_0(1+\alpha)z^{-1}+\alpha z^{-2}}$$

in which the notch frequency is determined according to a notch frequency variable k,

characterized in that said method further comprises the step of:

determining a value of k for the n+1th sample period ~~is determined~~ according to the following equation:

$$k(n+1) = k(n) - \mathrm{sgn}[y(n)]\,\mathrm{sgn}[UPDATEFN] \times \mu$$

in which y(n) is a notch filter output, μ is an adaptation constant, and UPDATEFN has a transfer function in the z-transform domain of:

$$\frac{(\alpha-1)(k(n)-1)z^{-1}}{1+k(n)(1+\alpha)z^{-1}+\alpha z^{-2}}$$

in which α determines a bandwidth and k(n) determines a current notch frequency.

7. (Currently Amended) ~~A~~ The method for adaptive line enhancement ~~according to~~ as claimed in claim 6, in which the Gray-Markel lattice notch filter is a wave digital lattice filter.

8-10. (Cancelled).